

CLAIMS

We claim:

1. A system adapted to eliminate undesired sounds during turn on of a FM modulator, the FM modulator having a RF output signal in communication with a radio receiver, a VCO modulation input, and a composite output signal, the system comprising:

a RF attenuator circuit in communication with the RF output signal of the FM modulator and adapted to initially reduce the RF output signal;

a RF ramp up circuit in communication with the RF attenuator circuit and adapted to deactivate the RF attenuator circuit; and

a delay switch circuit in communication with the RF ramp up circuit and adapted to delay activation of the RF ramp up circuit.

2. The system according to Claim 1, further comprising an audio ramp up circuit in communication with the RF ramp-up circuit and the composite output signal of the FM modulator, the audio ramp up circuit increasing the composite output signal.

3. The system according to Claim 2, the audio ramp up circuit including a resistor, a capacitor, and a transistor.

4. The system according to Claim 3, wherein a first side of the resistor is in communication with the delay switch circuit, a second side of the resistor is in communication with the capacitor and the transistor, the capacitor being connected between the resistor and an electrical ground.

5. The system according to Claim 4, the transistor of the audio ramp up circuit including a gate, a source, and a drain, wherein the gate is in communication with the resistor and the capacitor, the source is in connection with the composite output signal of the FM modulator, and the drain is in connection with the VCO modulation input.

6. The system according to Claim 1, the RF attenuator circuit including a transistor, the transistor having a base, a collector, and an emitter.

7. The system according to Claim 6, wherein the transistor is a PNP transistor.

8. The system according to Claim 6, wherein the emitter is connected to a power source, the base is in communication with the RF ramp up circuit, and a collector is in communication with the RF signal of the FM modulator.

9. The system according to Claim 1, the RF ramp up circuit including a capacitor and a first resistor.

10. The system according to Claim 9, wherein a first side of the capacitor is in communication with an electrical ground and a second side of the capacitor is in communication with the first resistor and the delay switch circuit, the first resistor being connected between a voltage source and the RF attenuator circuit.

11. The system according to Claim 1, the time delay circuit including a first and second transistor, a resistor, and a capacitor.
12. The system according to Claim 11, wherein the second transistor is a NPN transistor.
13. The system according to Claim 11, the NPN transistor having a base in communication with the second transistor, an emitter in communication with an electrical ground, and a collector in communication with the RF ramp-up circuit.
14. The system according to Claim 11, wherein the second transistor is a field effect transistor, the gate of the field effect transistor being in communication with the resistor and the capacitor, the source of the field effect transistor being in communication with an electrical ground, and the drain of the field effect transistor being in communication with the first transistor.
15. The system according to Claim 8, further comprising an audio ramp up circuit in communication with the delay switch circuit and the composite output of the FM modulator.
16. The system according to Claim 15, the audio ramp up circuit including a resistor, a capacitor, and a second transistor.

17. The system according to Claim 16, wherein a first side of the resistor is in communication with the delay switch circuit, a second side of the resistor is in communication with the capacitor and the second transistor, the capacitor being connected between the resistor and an electrical ground.

18. The system according to Claim 17, the second transistor of the audio ramp up circuit including a gate, a source, and a drain. wherein the gate is in communication with the resistor and the capacitor, the source is in connection with the composite output signal of the FM modulator, and the drain is in connection with the VCO modulation input of the FM modulator.

19. The system according to Claim 8, the RF ramp up circuit including a capacitor and a first resistor.

20. The system according to Claim 19, wherein a first side of the capacitor is in communication with an electrical ground and a second side of the capacitor is in communication with the first resistor and the delay switch circuit, the first resistor being connected between a voltage source and the RF attenuator circuit.

21. The system according to Claim 20, the RF ramp-up circuit including a second resistor, the second resistor being connected between the RF attenuator and the delay switch circuit.

22. The system according to Claim 7, the time delay circuit including a second and third transistor, a resistor, and a capacitor.

23. The system according to Claim 22, wherein the second transistor is a NPN transistor, the NPN transistor having a base in communication with the third transistor, a emitter in communication with an electrical ground, and a collector in communication with the RF ramp-up circuit.

24. The system according to Claim 22, wherein the third transistor is a field effect transistor, the gate of the field effect transistor being in communication with the resistor and the capacitor, the source of the field effect transistor being in communication with an electrical ground, and the drain of the field effect transistor being in communication with the second transistor.

25. A method to eliminate undesired sounds during the turn on of a FM modulator, the FM modulator having a RF output signal in communication with a radio receiver, a phase lock loop, and a composite output signal, the method comprising the steps of:

- attenuating the RF output signal using an RF attenuator circuit;
- locking onto the frequency of the RF output signal using the phase lock loop contained in the FM modulator; and
- increasing gradually power of the RF input signal.

26. The method according to Claim 25, further comprising the step of increasing gradually power of the composite output signal using an audio ramp up circuit.

27. The method according to Claim 25, wherein the step of increasing gradually power of the RF output signal is slower than the response rate of an automatic gain control contained in the radio receiver.

28. The method according to Claim 25, wherein step of increasing gradually power of the RF signal occurs after the step of locking onto the frequency of the RF signal.

29. The method according to Claim 25, wherein a RF ramp up circuit controls the gradual increase of the RF output signal.

30. The method according to Claim 29, wherein a time delay circuit activates the RF ramp up circuit causing gradual increase of the RF output signal.

31. The method according to Claim 26, wherein a time delay circuit activates the audio ramp up circuit.

32. The method according to Claim 26, wherein the step of increasing gradually the power of the composite output signal occurs after the step of locking onto the frequency of the RF signal.